

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB2004/051090

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G09G3/32 H05B33/08 H01L51/50 H01L31/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G09G H05B H01L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 03/054980 A (HUIBERTS JOHANNES N ; LIEDENBAUM COEN T H F (NL); VAN DE WALLE GERJAN) 3 July 2003 (2003-07-03) cited in the application page 5, line 20 - line 27; figure 1 page 6, line 24 - line 28 -----	1-4,6-8, 10
Y	DE 35 02 325 A (SIEMENS AG) 24 July 1986 (1986-07-24) page 1, line 39 - line 44 -----	1-4,6-8, 10
Y	US 4 945 226 A (FUKUDA TAKESHI ET AL) 31 July 1990 (1990-07-31) column 2, line 63 - column 3, line 2 -----	3
A	US 5 504 323 A (HEEGER ALAN J ET AL) 2 April 1996 (1996-04-02) cited in the application figure 1 -----	

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&amp;" document member of the same patent family

Date of the actual completion of the international search

22 December 2004

Date of mailing of the international search report

21.03.2005

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## Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

see annex

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-8,10

claim 5: order of pre-pulses with different polarity

NB:

Claims 1 - 4, 6 - 8, 10 are not new or inventive:

Document D1 (WO 03/054980), which is at present considered to represent the closest state of the art with regard to claim 1, discloses a dual-function electroluminescent device and a method for driving the same (see D1, title). More specifically, D1 discloses an electric device comprising:

- one organic diode (see "photodiode" 5 in D1, Fig. 1 & page 5, line 20 - 27);
- driving means for driving the organic diode in a light sensing state (see "power source" 6 in D1, Fig. 1a & page 6, lines 24 - 28).

The subject-matter of present claim 1 differs from the device according to D1 in that claim 1 further specifies: pre-pulse means for applying one or more electric pulses to the organic diode prior to driving the organic diode in the light sensing state.

However, D2 (DE 35 02 325) teaches the application of an electric pulse to supply a depletion current which quickly blanks the light-emitting diode after light excitation (see "Ausräumstrom" in D2, col. 1, lines 39 - 44).

Thus, a person skilled in the art aiming at integrating the sensing state into a display acc. to D1 (see D1, page 9, lines 8 - 15), who looks for an improvement of its brightness, i.e. to the minimization of the time needed to interrupt the display for sensing, would investigate the application of an electric pulse to supply a depletion current according to D2 in the device according to D1 and would thereby directly arrive at the subject-matter of claim 1.

Hence, subject-matter of claim 1 does not involve an inventive step.

Similarly, the subject-matter of claim 8, claiming a method corresponding to claim 1, is rendered obvious.

Also the subject-matter of the dependent claims 2 - 4, 6 - 7 and 10 would be anticipated by D1 combined with D2 and D3 (US-A-4 945,226).

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2. claim: 9

voltage of a positive pre-pulse

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 03054980	A	03-07-2003	AU 2002366897 A1 EP 1461799 A2 WO 03054980 A2	09-07-2003 29-09-2004 03-07-2003
DE 3502325	A	24-07-1986	DE 3502325 A1	24-07-1986
US 4945226	A	31-07-1990	JP 1115167 A JP 2071780 C JP 7070745 B	08-05-1989 25-07-1996 31-07-1995
US 5504323	A	02-04-1996	WO 9516275 A1	15-06-1995